

CLAIMS

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1. A preform for a container comprised of orientable plastics material and arranged so that the resultant blown container will include a handle or like support structure; said preform comprising a moulded structure having a neck portion and an expandable portion below the neck, at least one loop of orientable plastics material integrally connected at both a first end and a second end to a respective first location and a separate second location on said preform which when the container is formed constitutes said handle.
2. ~~A method of forming a container having an integral handle, said method comprising:~~
  - (a) forming a preform having a neck portion and an expandable portion below the neck portion, said preform having at least one loop of orientable plastics material integrally connected at both a first end and a second end to a respective first location and a separate second location on said preform, and
  - (b) performing a blow moulding operation on said preform to expand the expandable portion to form the body of the container.
3. The method of claim 2 wherein the neck portion includes a locating ring above the expandable portion.
4. The method of claim 2 wherein said container is formed from said preform in a two stage operation.
5. The method of claim 4 wherein the handle allows at least two fingers of the adult human hand to pass therethrough.
6. The method of claim 2 wherein the loop is formed so as to have an I-shaped cross-section at least throughout that portion of the stem where it projects from ~~the external side of said tube.~~
7. A parison or preform as claimed in claim 1 for an injection stretch blow moulding process, said parison formed by an injection process including two separate points of injection.
8. ~~The parison of claim 7 wherein a first point of injection permits injection of non-recycled PET or like plastics material.~~

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9. *a* The parison of claim 7 ~~or 8~~ wherein a second point of injection permits injection of PET or like plastics material incorporating at least a portion of recycled material.
10. *a* The parison of claim 7 ~~or 8~~ wherein said first point of injection is for the formation of that part of the parison which will be stretched during a stretch blow moulding operation on the parison.
11. The parison of claim 9 wherein said second point of injection is for the formation of those parts of said parison which will remain unexpanded or substantially unexpanded in a stretch blow moulding operation on said parison.
12. ~~A container manufactured from a two stage injection stretch blow moulding process, said container including a graspable handle integrally affixed at at least a first point and a second point to said container so as to form an enclosed area between the handle and the container and through which the fingers of a human hand may be passed.~~
13. The container of claim 12 wherein said first point of connection comprises an integral connection between the handle and the neck portion of the container and is formed in a first stage of said two stage process.
14. The container of claim 13 wherein said second point of connection is located on an expandable portion of said container.
15. The container of claim 13 wherein said second point of interconnection is located on a lower neck portion of said container at a substantially non-expanding part.
16. The container of claim 15 wherein said first and second points of connection are located on a substantially non-expanding part of said container.
17. *a* The container of ~~any one of claims 12 to 16~~ including an elongated substantially non-expanding neck portion to which said loop is affixed.
18. The preform of Claim 1 further including a locating ring immediately below which is a first non-expanding region and below which is a second non-expanding region.
19. *a* The preform of Claim ~~1 or~~ 18 wherein the first non-expanding region is formed so as to be slightly raised or otherwise differentiated from the expandable

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~~portion of said preform.~~

20. *a* The preform of Claim ~~18 or~~ 19 wherein the second non-expanding region is not differentiated from the expandable portion of said preform.
21. The preform of ~~any one of Claims 18-20~~ wherein the loop includes a first rib integrally moulded therewith.
22. The preform of Claim 21 wherein said loop includes a second rib integrally moulded with and extending from said second non-expanding region.
23. The preform of Claim 22 which further includes a rib connector integrally moulded with and extending from first non-expanding region and forming a continuous connection between said first rib and said second rib throughout the length of said loop.
- Ans* 24. The preform of ~~any one of Claims 18-23~~ and wherein said second non-expanding region forms part of a temperature transition zone.
- A* 25. The preform of ~~any one of Claims 18-24~~ and wherein said first non-expanding region forms part of said temperature transition zone.
- A* 26. The preform of Claim 24 ~~or Claim 25~~ wherein deformation of said temperature transition zone takes place during a stretch blow moulding process.
- A* 27. The preform of ~~any one of Claims 18-26~~ manufactured by a two stage injection moulding process wherein material is injected at different locations in the die to form a preform adapted to be composed from more than one type of material.
- A 26* 28. The preform of Claim 27 wherein during at least one stage of said two stage process an inner wall and outer wall of said preform is formed, said inner wall adapted to be made from a different material from said outer wall.
- Sub B5* 29. A container stretch blow moulded from the preform of ~~any one of claims 18-28.~~
30. A container made from PET material and stretch blow moulded from the preform of ~~any one of Claims 18-29.~~
31. A method of production as a two step process of an integral handle PET container from a preform which has a loop of orientable plastics material at least one loop of orientable plastics material integrally connected at both a first

end and a second end to a respective first location and a separate second location on said preform ; said method including the step of shrouding said loop of said preform during preheating of said preform preparatory to a stretch blow moulding step.

32. The method of Claim 31 wherein the loop is fully supported in a mould cavity against movement during the stretch blow moulding operation.
33. A container comprised of biaxially orientable plastics material manufactured from a two stage injection stretch blow moulding process; said two stage process comprising a first stage in which a preform is manufactured and a second stage in which said preform is reheated and biaxially stretched to form said container; said container including a graspable handle integrally affixed at at least a first point of connection and a second point of connection to said container so as to form an enclosed area between said handle and said container and through which at least two fingers of a human hand can pass.
34. The container of claim 33 wherein said first point of connection and said second point of connection comprises an integral connection between the handle and the container and is formed in said first stage of said two stage process.
35. The container of claim 34 further including a locating ring at a neck portion thereof.
36. The container of claim 33, ~~34 or 35~~ further including a first non-expanding region immediately below said locating ring.
37. The container of claim 36 further including a second non-expanding region below said first non-expanding region.
38. The container of claim 36 wherein said first non-expanding region is formed so as to be slightly raised or otherwise differentiated from that portion of said container which is fully biaxially oriented during said second stage of said two stage process.
39. The container of claim 37 wherein said second non-expanding region is not differentiated from that portion of said container which is fully biaxially oriented during said second stage of said two stage process.

40. The container of claim 37 ~~or claim 38~~ wherein minor expansion of said second non-expanding region takes place during said second stage of said two stage process.
41. The container of claim 37 wherein said handle includes a first rib integrally moulded with and extending from said locating ring.
42. The container of claim 41 wherein said handle includes a second rib integrally moulded with and extending from said second non-expanding region.
43. The container of claim 42 which further includes a rib connector integrally moulded with and extending from said first non-expanding region and forming a continuous connection between said first rib and said second rib throughout the length of said handle.
44. The container of claim 44 wherein said second non-expanding region forms part of a temperature transition zone.
45. The container of claim 36 wherein said first non-expanding region forms part of a temperature transition zone.
46. The container of claim 45 wherein deformation of said temperature transition zone takes place during a stretch blow moulding process.
47. The container of claim 33 manufactured by said two stage injection moulding process and wherein material is injected at different locations during formation of said preform during said first stage of said two stage process whereby said container can be composed from more than one type of material.
48. The container of claim 47 wherein during said first stage of said two stage process an inner wall and outer wall of said preform is formed, said inner wall made from a different material from said outer wall.
49. The container of ~~any one of claims 33-48~~ further including a discontinuity region ~~as defined in the specification.~~
50. The container of Claim 49 wherein said discontinuity region lies in a plane which lies at an acute angle to the horizontal, said discontinuity region extending substantially throughout the circumference of said container.
51. The container of any one of Claim 49 ~~or Claim 50~~ wherein said discontinuity region at its point closest to said handle is located between a first end and a

second end of said handle.

52. A preform from which the container of ~~any one of Claims 33 to 51~~ is shown in a two stage process, said preform including more than one wall profile.
53. The preform of Claim 52 wherein said preform has a first wall profile closest to its neck followed by a second wall profile immediately there below and separated therefrom by a first transition zone.
54. The preform of Claim 53 wherein said preform further includes a third wall profile ~~immediately~~ below said second wall profile and separated therefrom by a second transition zone.
55. An injection machine for the manufacture of a parison or preform according to Claim 1 or any one of Claims 7 to 11 or any one of Claims 19 to 28 in a first stage of a two stage process.
56. A stretch blow moulding machine for the manufacture of a container having an integral handle, said machine operable according to the method of any one of Claims 2 to 6 or any one of Claims 31 or 32.
57. An injection machine for the manufacture of preforms having integral handles incorporated therein; said machine including moulds having a channel which permits PET material to flow into a stem portion which constitutes a handle in a container blown from a preform produced by said injection moulding machine.
58. The injection machine of Claim 57 wherein said channel of said mould includes a return portion whereby said stem is connected integrally at two points on said preform.
59. An injection blow moulding machine incorporating heat insulating means to insulate handle portions of preforms during heating of said preforms prior to stretch blow moulding thereof.
60. The machine of Claim 59 wherein said insulating means comprises a shroud.